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Fuzzy logic = computing with words

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Abstract:

As its name suggests, computing with words (CW) is a methodology in which words are used in place of numbers for computing and reasoning. The point of this note is that fuzzy logic plays a pivotal role in CW and vice-versa. Thus, as an approximation, fuzzy logic may be equated to CW. There are two major imperatives for computing with words. First, computing with words is a necessity when the available information is too imprecise to justify the use of numbers, and second, when there is a tolerance for imprecision which can be exploited to achieve tractability, robustness, low solution cost, and better rapport with reality.

Exploitation of the tolerance for imprecision is an issue of central importance in CW. In CW, a word is viewed as a label of a granule; that is, a fuzzy set of points drawn together by similarity, with the fuzzy set playing the role of a fuzzy constraint on a variable. The premises are assumed to be expressed as propositions in a natural language. In coming years, computing with words is likely to evolve into a basic methodology in its own right with wide-ranging ramifications on both basic and applied levels.

Index Terms:

fuzzy logic fuzzy set theory inference mechanisms natural languages
constraint handling computational linguistics computing with words
reasoning fuzzy logic imprecision tolerance fuzzy set theory similarity
fuzzy constraint natural language

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